MANONTON BUTARGABE, PhD

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SUMMARY

Skillfully directed, managed, planned, collaborated, and coordinated software development projects as a software engineering manager, product manager, and project manager utilizing 20+ year hands-on experience and the knowledge of a PhD degree in Computer Science with minor in Business Administration. Passionately defined, designed, developed, tested, and deployed complex high-quality software products as a software architect and a software engineer. Creatively invented, prototyped, published, and implemented algorithms and products as a research engineer. Enthusiastically researched and taught computer science courses as a professor.

AREAS OF EXPERTISE

- Software Engineering: software architecture, software design, object-oriented analysis and design, UML using Enterprise Architect, design patterns, web services, software integration, database modeling, data structures, software project estimates, advanced algorithms, computational complexities, agile software development, and software improvement process
- Computer Science: databases, computer networks, operating systems, cryptography, and software security
- Research: search engines, text document indexing and searching, topic identification, information retrieval, natural language processing, string processing, and artificial intelligence
- Programming Languages: C#, C++, C, Java, Pascal, Lisp, and FORTRAN
- Relational Database Management Systems: Microsoft SQL Server, Oracle, and IBM DB2
- Tools and OS: Microsoft Visual Studio, Microsoft Entity Framework, Microsoft Office, Microsoft Project, Software Configuration Management Tools, Microsoft Team Foundation Server (TFS), Bitbucket / Mercurial, Telelogic CM Synergy, Microsoft Visual SourceSafe, PVCS, InstallShield, Minitab, Mathematica, Windows, Unix, and Linux

PROFESSIONAL EXPERIENCE

MSI, Mequon, Wisconsin, USA   **2013 – 2016**

Software Engineering Manager
- Communicated, captured, and defined customer requirements in field services, analyzed gaps between requirements and existing features, and designed complete solutions for customers.
- Directed the development of the field service management software, Service Pro, with major additional features, mobile applications, web applications, and new integrations with ERP systems using web services. The entire system was developed using various technologies: C#, .Net, SQL Server, JavaScript, Xamarin, Delphi, Microsoft Visual Studio, Microsoft Team Foundation Server (TFS), Scrum, Redmine, and Project Portal.
- Defined, designed, planned, managed, developed, tested, and verified the entire systems that provide complete solutions to customers.
- Modularized and orchestrated the development of software products among 12 software engineers to achieve milestones as planned. Tracked important metrics of software development projects.

- Researched and resolved any conflicts and roadblocks during the entire software development life cycle.
- Collaborated with Software Quality team and Professional Service team to produce high quality software products that meet customer needs.
- Maintained excellent communication with customers in getting feedback and negotiated consensus.
- Deployed software, trained, and supported customers. As a result, satisfied customers recommended the software to other customers resulting in additional software product sales.
- Developed software using C#, SQL database, and web service to integrate the company software product and an ERP system so that data changes made in one system automatically flow to the other system.

JOHNSON CONTROLS, Milwaukee, Wisconsin, USA **1994 – 2012**

Product Manager and Project Manager

- Wrote requirement specification for an Enterprise Integration Framework that integrates various JCI products such as video management system (DVN), access control system (P2000 SCT), HVAC system (Metasys NAE and NCE), as well as other third party systems based on enterprise messaging where the enterprise applications are integrated by exchanging messages asynchronously. Messages are exchanged between applications using an enterprise bus which can be either Microsoft Messaging Queue (MSMQ) or IBM WebSphere MQ.
- Specified requirement of a Security Information Retrieval System that extracts video clips related to alarms, events, and financial transactions.
- Tracked and managed the development tasks of a software engineer team (4 people) who extended the features of P2000 SCT, a system that automatically generates and configures applications for security supervisory controllers.
- Wrote the software architecture and product specification of the synchronization feature of Metasys configuration tool (AIM-GT/CCT) that downloads, uploads, and synchronizes HVAC supervisory controllers and field devices from a central database. Translated user requirements into product specification. Lead and managed the software product development. This sub-system was part of a larger project that employed about 100 software engineers with a dozen software technical leaders and project managers.
- Supervised, coordinated, and tracked team progress of about 10 software engineers who implemented the synchronization feature of AIM-GT/CCT software product.
- Negotiated consensus on interface and performance issues between the AIM-GT sub-systems.
- Used function point technique to estimate software project sizes and to plan the AIM-GT project.

Software Architect and Technical Leader

- Invented, designed, and implemented algorithms to automatically discover space (buildings, floors, rooms), equipment (air handling units, variable air volume units, meters), points (zone temperatures, supply air flows, effective cooling set points), and their relationships such as where pieces of equipment are located, to avoid manual configuration of space units, pieces of equipment, and points for a smart enterprise building application. The auto discovery was done by applying data mining techniques, text pattern matching, space ontology, and word forms recognition of plain text information extracted from SQL databases.

- Performed technical feasibility and designed the Security Alarm and Event Management System, a large transaction processing system, to receive and store 5000 transactions per second and to support the retrieval of video clips within seconds from a collection of terra-byte video storages.
- Invented and wrote the design specification of the company device synchronization software product. The software product was written in Java, C#, .NET, web services, Microsoft SQL Server, C++, and C.
- As a Software Engineering Process Group (SEPG) member, led software improvement process from Capability Maturity Model (CMM) Level 1 to Level 2.
- Invented, designed, developed, and tested a brand new software product called M-Collector that gathers trend data from 5000 HVAC supervisory controllers connected via telephone lines and or Ethernet connections. The system is required to collect data via 24 phone lines in parallel (a configurable number of lines) and to write 2000 trend data samples per second into a Microsoft SQL or Oracle database. The M-Collector is a multi-threaded application utilizing COM objects and OPC servers. Led the entire software development life cycle (SDLC).

Software Engineer

- Designed, developed, and tested additional SNMP feature in C++ for a complex video surveillance system (DVN) that notifies customers when critical conditions occur such as a surveillance camera is disconnected, a RAID disk becomes critical, a connection to a time server has been lost, etc. This feature requires multi-threaded applications as well as inter-process communications using shared memory technique.
- Extended the capability of an existing product, P2000 SCT, using Java, Swing components, and web services to support graphical drawing, including drag and drops of block and flow diagrams to configure security supervisory controllers.
- Integrated two separately and independently developed systems, P2000 written in C# and SCT written in Java. Data entered via P2000 user interface must be visible and modifiable from the SCT user interface and vice versa. The two systems, using two different Microsoft SQL databases, are integrated via web services.
- Dramatically improved P2000 SCT user interface rendering speed from 120 seconds to less than 1 second, by the use of cache and hash techniques.
- Dramatically improved the performance of writing data to a Microsoft SQL database by applying product development for six sigma (PDFSS) methodology.
- Implemented the company data collector system in C++ to gather data from HVAC supervisory controllers and to write data to Microsoft SQL and Access databases using ODBC interface.
- Designed and developed a COM time zone component, in C++ and XML, that converts time stamps from various time zones to the Coordinated Universal Time (UTC) and vice versa.
- Developed install programs for an HVAC system, Metasys M3, using InstallShield.
- Designed and developed communication software / firmware in C that connects JCI Metasys Integrator with HVAC controllers of various vendors such as Liebert, Westinghouse, ABB, Fireye, McQuay, Airflow, York, etc.

UNIVERSITY OF WISCONSIN – MILWAUKEE, Wisconsin, USA   1992 – 2011

Adjunct Professor

- Taught a senior level course, CS-422 Introduction to Artificial Intelligence, at the University of Wisconsin – Milwaukee. [2009 – 2011]

Research Scientist [1992 - 2006]

- Designed and developed a new technique to index and search text documents as part of my doctorate program. The improvement is 34% better than the current published state-of-the-art indexing and searching techniques. The measurement is based on the TREC data provided by the National Institute of Standards and Technology (NIST). The system, called iIndex, is written in 84,000 lines of C++ code, manages 3.5 million index entries in a Microsoft SQL database. The system finds and retrieves relevant documents in the database in less than a second.
- Published the technique, design, and implementation of the system in the Proceedings of the 11th International Conference on String Processing and Information Retrieval (SPIRE 2004).
- Invented, designed, developed, and periodically added features to my personal knowledge management system, called iTag, based on the concepts in my PhD dissertation as well as the use of document tagging and the notion of semantic distance to rank related documents. The goal is to return the most relevant knowledge (documents, notes, pictures) to a given topic usually in the form of phrases. The code is developed using C++, C#, and SQL database. [1999-Present]
- Performed research in decision support and artificial intelligence and developed temporal planning system in Lisp.

Teaching Assistant [1992-1997]
- Taught the following courses: Object-oriented Programming with C++, Computer Graphics, Computer Programming I and II, Scientific Programming, and Data Structures.

UNIVERSITY OF INDONESIA, Jakarta, Indonesia   1987 – 1989

Research Scientist
- Designed and developed an application program called Extended Computer Assisted Learning System using Pascal and Intelligent Decision Support for Scheduling System using Lisp.

Professor
- Taught the following courses: Pascal Programming, Data Structures, Operating Systems, and Compilers.

POSTAL SERVICE, Bandung, Indonesia   1986

Software Engineer and Database Administrator
- Designed and implemented a database system that stores and maintains the entire employee data for the Postal Service of the Indonesian Government.
- Developed applications in COBOL that generate several human resources related reports.

INDONESIA DRILLING AND CONSULTANT, Jakarta, Indonesia   1983 – 1986

Software Engineer and Database Administrator
- Designed and implemented a relational database system that stores data about quantity accounting system for crude oil productions used by a government oil and gas agency called Pertamina.
- Designed and developed applications that produced reports for crude oil production monitoring and forecasting.

EDUCATION

- PhD in Computer Science, University of Wisconsin, USA.
- MS in Computer Science, University of Wisconsin, USA.
- BS in Computer Science, Bandung Institute of Technology, West Java, Indonesia.

TRAINING

- IBM Rational University, Mastering Object-Oriented Analysis & Design using UML
- LearningPatterns.com, Java Swing
- Learning Tree International, COM and ActiveX Programming with C++: Hands-On
- Carnegie Melon University - Software Engineering Institute, Capability Maturity Model
- Dr Maurice L. Berryman, Product Development for Six Sigma: Software Development

PUBLICATION

- Manonton Butarbutar. *Searching and Indexing Text Documents Based on Topic Identification*. PhD Thesis. University of Wisconsin – Milwaukee, December 2006. (Submitted to ACM TOIS)
- Manonton Butarbutar and Susan McRoy. *Indexing Text Documents Based on Topic Identification*. In the Proceedings of the Eleventh International Conferences on String Processing and Information Retrieval (SPIRE 2004*)*, pages 113-124, October 2004.
- Peter Haddawy, Charles E. Kahn, and Manonton Butarbutar. *A Bayesian Network Model for Radiological Diagnosis and Procedure Selection: Work-up of Suspected Gallbladder Disease*. Med Phys 1994; 21:1185-1192.

I am a **citizen** of the United States of America.